# Solutions: Conditional Probability and Independence Checkpoint 2

## Question 1

Select one answer.
*10 points*

Dogs are inbred for such desirable characteristics as blue eye color; but an unfortunate by-product of such inbreeding can be the emergence of characteristics such as deafness. A 1992 study of Dalmatians (by Strain and others, as reported in *The Dalmatians Dilemma*) found the following:

| | |
|---|---|
| (i) | 31% of all Dalmatians have blue eyes. |
| (ii) | 38% of all Dalmatians are deaf. |
| (iii) | 42% of blue-eyed Dalmatians are deaf. |

What is the probability that a randomly chosen Dalmatian is blue-eyed *and* deaf?

- (a) .31 * .38 = .1178
- (b) .31 * .42 = .1302
- (c) .38 * .42 = .1596
- (d) .31 / .38 = .8158
- (e) .31 / .42 = .7381
- (f) .38 / .42 = .9048

**Correct answer: (b)**

The next four questions refer to the following information:

Two methods, A and B, are available for teaching a certain industrial skill. There is an 80% chance of successfully learning the skill if method A is used, and a 95% chance of success if method B is used. However, method B is substantially more expensive and is therefore used only 25% of the time (method A is used the other 75% of the time). The following notations are suggested:

- **A**—method **A** is used
- **B**—method **B** is used
- **L**—the skill was **L**earned successfully

## Question 2

Select one answer.
*10 points*

Which of the following is the correct representation of the information that is provided to us?

- (a) P(A) = .75, P(B) = .25, P(L | A) = .80, P(L | B) = .95
- (b) P(A) = .75, P(B) = .25, P(A | L) = .80, P(B | L) = .95
- (c) P(A) = .75, P(B) = .25, P(A and L) = .80, P(B and L) = .95
- (d) P(A | L) = .75, P(B | L) = .25, P(L | A) = .80, P(L | B) = .95
- (e) P(A and L) = .75, P(B and L) = .25, P(L | A) = .80, P(L | B) = .95

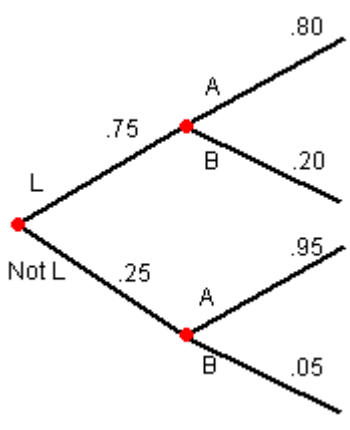
**Correct answer: (a)**

## Question 3

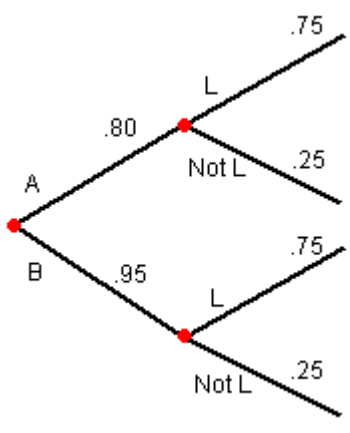
Select one answer.
*10 points*

Which of the following is the correct probability tree for this problem?

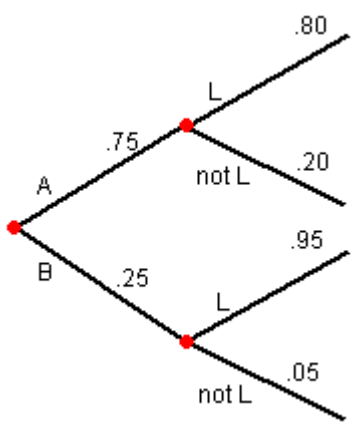
- (a)



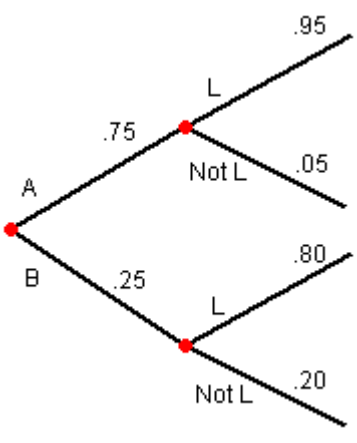

- (b)




- (c)




- (d)




**Correct answer: (c)**

## Question 4

Select one answer.
*10 points*

What is the probability that a worker will learn the skill successfully?

- (a) P(L) = .75 * .80 = .60
- (b) P(L) = .25 * .95 = .2375
- (c) P(L) = .75 * .25 + .80 * .95 = .9475
- (d) P(L) = .75 * .95 + .25 * .80 = .9125
- (e) P(L) = .75 * .80 + .25 * .95 = .8375

**Correct answer: (e)**

## Question 5

Select one answer.
*10 points*

A worker learned the skill successfully. What is the probability that he was taught by method A?

- (a) .75 * .80 = .60
- (b) .80
- (c)

$$\frac{.25*.95}{.75*.80+.25*.95}=.2836$$

- (d)

$$\frac{.75*.80}{.75*.80+.25*.95}=.7164$$

- (e)

$$\frac{.75*.80}{.8+.95}=.3429$$

**Correct answer: (d)**

^ Top ^

Save  Submit and finish